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Building readiness and foresight for Zero-Emission Mobility Solutions in the metaCCAZE project through Status Quo Mapping – The Limassol Living Lab

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Introduction

- ❑ European cities are transitioning toward **zero-emission mobility**
- ❑ Challenge: aligning innovation with:
  - Local conditions
  - Policy frameworks
  - Stakeholder needs

Project Context

metaCCAZE (Horizon Europe) supports:
10 **Living Labs (LLs)** across Europe

4 Trailblazer Cities: *Amsterdam, Munich, Limassol, Tampere*

6 Follower Cities : *Athens, Kraków, Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region)*

10 Observer Cities: *Alexandroupolis, Braga, Bremen, Bucharest, Bursa, Cahul, Helmond, Liepaja, Naples, Vitoria-Gasteiz*

Focus: deployment of **innovative mobility solutions**

Key Need: Cities require a structured way to assess: i)Readiness, ii)Barriers and iii)Available resources

Objectives

Develop a **Status Quo Mapping methodology** to:

1. Assess city readiness
2. Support tailored implementation of mobility solutions

Enable context-aware, scalable zero-emission mobility deployment

Methodology: Status Quo Mapping

Conceptual Foundation

Builds on:

1. **Living Labs & co-creation**
2. **Co-design methodologies**
3. **Data-driven evaluation frameworks**

Addresses gap: **No unified framework combining policy, users, and data**

Framework Structure:

1. **Capability Map:** Policies, infrastructure, resources
2. **Empathy Map:** Stakeholder needs & perceptions
3. **Data Map:** Data availability & quality

Combined into a **comprehensive readiness assessment, a Status Quo Map.**

Analytical Approach

Uses:

1. **Standardized templates** (across cities)
2. **Qualitative comparative analysis**
3. **Co-creation & stakeholder engagement**

Outputs

Identifies: i)Strengths & gaps, ii)Implementation barriers, and iii)Data readiness

Supports:

1. **KPI selection (SIEF)**
2. **Realistic and scalable solutions**

Limassol: Status Quo Mapping

Case Study: Limassol Living Lab

Use Cases Analysed

Use case code	Title
UC01	On-demand mini-buses services
UC02	Shared e-bikes
UC03	Multimodal passenger hub
UC04	Transport & Energy Platform

Table 1: Limassol LL's use cases in the metaCCAZE project

Capability Map

Assess city readiness in terms of **policy, infrastructure, and institutional capacity.**

Key Dimensions

- **City profile & mobility context**
- **Policy alignment** : i)SUMP and ii) Climate City Contract (CCC)
- **Existing services & infrastructure**
- **Barriers & enabling factors**

Table 1: Synthesis of the Capability Map of Limassol LL

Dimension	LI-UC01 (On-demand buses)	LI-UC02 (Shared -bikes)	LI-UC03 (Multi-Modal Hub)	LI-UC04 (Transport and Energy platform)
Policy Alignment (SUMP/CCC)	Strong	Strong	Strong	Moderate (future-oriented)
Objective	Reduce car dependency, flexible PT	Promote active mobility	Improve multimodality	Optimize energy–transport integration
Existing Services	Bus system, traveller info	Bike-sharing pilots	PT network	Charging infrastructure
Experience from Projects	CIVITAS, SUMPORT	CIVITAS	Limited	Limited
Key Barriers	User adoption, service design	Terrain, infrastructure gaps	Governance coordination	Data integration, grid complexity
Enabling Factors	AI routing, existing demand	Digital platform, docking expansion	Strategic location	IoT platform, CCC alignment

Identifies **strategic alignment & implementation feasibility**

Empathy Map

Capture **stakeholder needs, perceptions, and behaviours**

Approach

- Workshops & co-creation sessions
- Focus groups & stakeholder dialogues
- Interactive tools (e.g., Mentimeter)

Table 2: Synthesis of the Empathy Map of Limassol LL

Dimension	LI-UC01 (On-demand buses)	LI-UC02 (Shared -bikes)	LI-UC03 (Multi-Modal Hub)	LI-UC04 (Transport and Energy platform)
Stakeholders	Students, families, operators	Citizens, commuters	Authorities, PT users	Authorities, energy providers
Key Needs	Reliable, safe, easy booking	Accessible bikes, better coverage	Seamless transfers, info systems	Real-time coordination, efficiency
Barriers	Safety concerns, usability	Terrain, station placement	Institutional coordination	Data sharing, system integration
Behavioural Insights	Car dependency	Low cycling culture	Need for convenience	Trust in digital systems
Key Insight	Integration with existing apps needed	Localised planning critical	Strong governance needed	Backend intelligence is key

Outputs

Reveals:

- Social acceptance factors
- Behavioural barriers
- User-driven design insights

Ensures **user-centred mobility solutions**

Data Map

Evaluate **data availability and readiness** for implementation and monitoring

Data Categories

- **City-wide datasets:** Traffic, infrastructure, public transport
- **Use case-specific data**
- **Contextual datasets:** Environment, travel behaviour

Table 3: Synthesis of the Data Map of Limassol LL

Dimension	LI-UC01 (On-demand buses)	LI-UC02 (Shared -bikes)	LI-UC03 (Multi- Modal Hub)	LI-UC04 (Transport and Energy platform)
Data Availability	High (70%)	High (75%)	High (75%)	Medium (60%)
Data Sources	EMEL, PT systems	Nextbike	Municipality	Energy + transport systems
Data Type	Ridership, routes	Usage, GPS	PT + infrastructure	Energy + mobility
Key Gaps	Real-time integration	Demand forecasting	Hub performance data	EV charging + grid data
Readiness Level	High	High	Medium	Medium–Low
Workarounds	Surveys, logs	Usage analytics	Proxy indicators	User logs, simulations

Outputs

Identifies: i) Available data assets and ii)Data gaps & limitations

Supports **KPI development & evaluation framework**

Results: Status Quo Mapping (SQM) Application

Key Findings

Policy & Strategic Alignment

- Strong alignment with:
  i) SUMP (2019) and ii) Climate City Contract (2024)
- Supports:
  i) Reduced car dependency and ii) Electrification & shared mobility

System Readiness

- Existing infrastructure & past projects support implementation
- Gaps identified in:
  i) Governance coordination and ii) Policy coverage (e.g. energy systems, V2G)

Stakeholder Insights

- Key concerns:
  - Safety
  - Usability
  - Travel time
- Behavioural barriers:
  - Car dependency
  - Low trust in new systems

Data Readiness

- Strong baseline datasets available
- Critical gaps:
  - Data interoperability
  - Real-time system integration
  - Energy & infrastructure data

Cross-Use Case Insights

- Strong **interdependencies between use cases**
- Existing systems can support **multiple applications**
- Enables: i)Integrated planning and ii) Efficient resource allocation

Conclusions

1. The SQM framework **integrates capability, stakeholder perspectives, and data analysis** to **evaluate city readiness for zero-emission mobility.**
2. The methodology highlights existing assets, institutional barriers, and data limitations, **enabling a clear understanding of implementation challenges.**
3. By aligning local conditions with project objectives**, SQM enables context-specific and feasible mobility solutions** across diverse cities.
4. SQM supports **evidence-based decision-making and cross-city knowledge transfer**, facilitating **scalable and inclusive mobility transitions.**

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